[Greensted Church.]

CHURCH AT GREENSTED, ESSEX.

[From a Correspondent.]

Greensted is a little secluded village about a mile from Ongar and twenty from London. Consisting of a few scattered farm-houses and cottages, and without a public-house of any kind, it would not be easy perhaps to find a quieter spot within the same distance; nor, in its way, a pleasanter. Lying out of the main road, however, neither its pretty green lanes nor its old church appear sufficiently attractive to induce the visits of many strangers. Yet its church is a remarkable structure. It is held by many to be a genuine Anglo-Saxon wooden building; at least its nave is so held. Of late, it is the fashion to call such buildings Norman. Greensted Church is, however, associated with an occurrence very characteristic of the Anglo-Saxon period, and we shall therefore consider it Anglo-Saxon.

It will be remembered that in one of the early incursions of the Danes into England (A.D. 870), Edmund, king of East Anglia, was taken prisoner by them, and, refusing to abjure the Christian religion, put to a cruel death. He was a favourite of the people, but especially of the priests; and came naturally therefore to be spoken of as a martyr, and his remains to be held in estimation as those of a saint. In the reign of Ethelred the Unready, the Danes, emboldened by the cowardice or feeble policy of the king, who only sought to buy them off from day to day, and made tyrannous by the diminished opposition everywhere offered to them, ravaged the country in all directions, until at length, in the year 1010, "that dismal period," as Mr. Sharon Turner calls it, "their triumph was completed in the surrender of sixteen counties of England and the payment of 48,000*l*." In this year the bones of St. Edmund were removed from Ailwin to London, to prevent their falling into the hands of the Danes.* They appear to have remained in London about three years, when they were carried back to Bedricesworth (Bury St. Edmund's). A MS. cited by Dugdale in the 'Monasticon,' and entitled '*Registrum cœnobii S. Edmundi*,' informs us that on its return to Bury, "his body was lodged (*hospitabatur*) at Aungre, where a wooden chapel remains as a memorial to this day." It is this same "wooden chapel" which is supposed to form the nave of Greensted Church. The inhabitants of the village have always had a tradition that the corpse of a king rested in it, and the appearance of the building vouches for its great antiquity.

Greensted adjoins Ongar; and that the ancient road from London into Suffolk ran through Old Ford, Abridge, Stapleford, Greensted, Dunmow, and Clare, is evident as well from the remains of it that are still visible, as from tradition. Stanford Rivers, the parish adjoining Greensted on the London side, is thought to be so named from the *stone ford* which was there made across the Roden for the convenience of the traffic along that road. We are told by the register above mentioned that the wooden chapel remained afterwards in memory of that transaction; so that it might in process of time, with proper additions made to it, be converted into a parish church. And of the antiquity of Greensted as a parish there is plenty of evidence; thus we find by *Newcourt* that Simon Feverell succeeded John Lodet as rector of *Grinsted juxta Ongar* in 1328. He says likewise that Richard de Lucy very properly divided the parishes of Grinsted and Ongar, and built the church at Ongar, in the reign of Henry II. But it has never, we believe, been questioned, says Mr. Letheuillier, that the nave of the present church is the identical wooden building erected as a shrine for Edmund's corpse just eight hundred and thirty years ago.

The building is as simple in its construction as we might expect from the object for which it was erected—a rural chapelry in a large parish. It is formed of the trunks of oaks about a foot and a half in diameter, split in half and roughly hewn at each end, to let them into a sill at the bottom, and into a plank at the top, where they are fastened with wooden pegs. This is the whole of the original fabric which yet remains entire, though much corroded and worn by time and long exposure to the weather. It is twenty-nine feet nine inches long by fourteen feet wide, and five feet six inches high on the sides which supported the primitive roof. The oaken trunks are arranged as closely side by side as their irregular edges will permit. On the south side there are sixteen of them, and two doorposts, with an opening for the entrance; on the north side there are twenty-one, and two vacancies filled up with plaster. The ends were similar, but the eastern has been removed and the church enlarged by the addition of a brick chancel; the western end re-

* The following particulars, with the admeasurement of the church, are mostly taken from a description contributed to the Society of Antiquaries by S. Letheuillier, Esq., and published in their 'Vetusta Monumenta,' 1747.

mains, but is hidden by a wooden tower that has been erected against it. On the south side there is a wooden porch, and both sides have been strengthened by brick buttresses.

The old wood appears little more decayed now than when Mr. Letheuillier described it, nearly a century since, as much corroded and worn by time. It is so blackened with age that it is not easy to tell what kind of wood it really is. Mr. Letheuillier, as we have seen, says it is oak, and his account is generally received; we have heard very good judges affirm it to be chestnut, but, although we examined it closely, we were unable to decide the point without cutting the wood, and that we were unwilling to do. The brick chancel which has been added to its east end appears younger than the nave; it probably, judging from the carved mouldings of the blunt-pointed arch of the doorway,* belongs to the later Norman period. Altogether, the church, though rudely venerable in appearance, has so substantial a look as almost to promise, if carefully attended to, to last another eight centuries.

We know of few churches near London more deserving of a visit; few that have such strong claims in themselves; and none that have been so little injured by modern improvements, or so little defaced by recent embellishments. And, like all old churches and few new, it seems to accord most felicitously with the spot on which it is placed. There is nothing about the church or the scene to weaken the strong feeling sure to be excited by the sight of so remarkable a relic of a remarkable period. Nor need the imaginative visitor fear that his ruminations will be interrupted by inquisitive intruders or troublesome guides. He may let his memory recal, or his fancy picture, the uncouth pageant of that day, when our Saxon ancestors in their quaint costumes crowded from every adjacent hamlet to gaze upon the reliques of their king, martyr, and saint; and nought will disturb the vision or break the deep silence, unless it be the song of the lark or the call of the thrush, or the distant sound of a flail.

The scenery too about Greensted is much pleasanter than Essex scenery is usually considered. Stanford Rivers and Navestock on one side, with Ongar on the other, offer some walks of much beauty, and there are green lanes all about the neighbourhood, such as it is a delight to meet with.

Our engraving is from an original sketch, and represents the present appearance of the church.

* In the plate in the 'Vetusta' this is inaccurately represented as a round arch.

THE FLOODS AND AVALANCHES OF THE ALPS.

THE sudden inundations of snow, or of ice, and of water, to which the Swiss villages are liable from the neighbouring mountains, are so intimately connected with the formation and the movement of *glaciers*, that they cannot be understood without reference thereto; and we will therefore refer to our recent paper on the nature of glaciers (No. 756) as a means of illustrating the details contained in the present article.

It was stated in the former paper that the Alpine glaciers occupy either the higher valleys or else the sloping sides of the loftier mountains; and that their gradual descent—be its cause what it may—frequently brings them down into the greater or lower valleys, even so far as to urge them part of the way up the opposite slope. The manner in which this slow movement of glaciers may give rise to catastrophes, we shall presently explain; but we may first notice the *avalanches*, or falls of snow, to which the valleys are exposed.

During many months of the year, snow is almost constantly falling in the higher regions of the Alps; and by degrees the accumulation becomes so great that the inclined sides of the mountains are not able to retain it; it becomes urged onwards by its own weight, and precipitated into the underlying valley, burying forests, villages, cattle, and, too often, human beings beneath it There are different kinds of avalanches or snow-falls according to the season of the year. The *drift* avalanche, occurring in the early part of winter, results from a heavy snow-storm falling during a calm, and afterwards acted on by the wind. The snow is driven from one acclivity to another, increasing its size as it proceeds, and at length the whole body falls into the valley below; but as the snow is in a light or drift state, it does not produce so much mischief as the *rolling* avalanche, which occurs towards the end of winter. When the immense mass of winter-snow becomes slightly thawed in the spring, the partially melted surface acquires a damp or clammy state, which makes the whole cohere into a more compact mass than the snow previously presented. The snow aggregates into balls or masses, which enlarge by constant additions as they descend; and at length it acquires such an enormous bulk and such a great velocity of movement, that it bears down everything before it, and either crushes or overturns trees, houses, and rocks. In 1749 a whole village was covered by one avalanche, and even removed from its site, and all with perfect stillness so far as the movement of the snow was concerned: a hundred persons were afterwards dug out of the snow, of whom about half still survived. Numerous other cases have been recorded of entire villages being overwhelmed; and there is a well-known narrative of a family who existed for a very long period enveloped in the snow of an avalanche.

Another kind of avalanche, known by the distinctive name of the *sliding*, occurs in the spring. When the surface-snow has been thawed on the lower and less steep declivities, the layers of snow nearest the ground become saturated with water, and thus the whole becomes loosened, giving rise to a gradual sliding movement, which brings the mass to the bottom, but without working so much mischief as the rolling masses. The *ice* avalanche is simply the falling of fragments of ice from the lower ends of the glaciers, loosened by the summer heat.

The manner in which a flood of water, called in the Alpine districts a *debacle*, may be occasioned by a glacier, will next claim our notice.

If there be a narrow gorge between two mountains, and descending to a lower valley beneath, it frequently happens that a glacier occupies this gorge, and descends by degrees till it completely crosses the lower valley. If, further, there be a river flowing through this lower valley, the glacier may so completely stop its path as to form a dam, behind which the waters of the river will rise and form into a lake. This was precisely the circumstance which occurred in Switzerland in 1818, when a fearful consequence followed. The details have been given by M. Esher de la Linth, in the 'Philosophical Journal,' and in one of the sketches by Captain Basil Hall, who visited the spot immediately after the catastrophe. From these two sources we will transcribe the chief details.

The Val de Bagnes, near Martigny, is a steep, narrow, rugged valley or rocky glen, running for about thirty or forty miles in an east and west direction among the mountains which separate Switzerland from Piedmont. The mountains have numerous glaciers in their gorges or upper valleys, and at one spot a glacier was so circumstanced as to protrude into the valley beneath. This valley has flowing along its bottom the river Dranse, a tributary to the Rhône,

some distance above the junction of the latter with the Lake of Geneva. The banks of this river are in most places precipitous; but wherever there is a little spot at all capable of being cultivated, there the hardy and industrious Switzer establishes himself, and builds one of the pretty cottages which have become such favourites among our painters and tourists; so that occasionally along the banks of the river there are little green patches to relieve the otherwise rugged scene. To connect these spots together, slender and rude bridges are thrown across the glen, which has the river flowing beneath, and thus the mountaineers connect themselves into something like a social community.

At a short distance from the upper end of this valley is the spot where the glacier intrudes its icy foot into the channel where the river flows. The glacier itself has not taken up this position, but blocks of ice and masses of snow, derived from it, have been precipitated from time to time, so that the stream has been for a long period more or less impeded. So long back as the year 1595 the valley was completely shut up by the descent of immense masses of ice. The water rose to an enormous height behind this barrier; and on the evening of Sunday, the 4th of June, in that year, the icy barrier having become weakened both by the pressure of the water and the heat of the sun, it gave way. The accumulated waters at once descended the valley with irresistible fury, carrying along with them masses of rock of enormous magnitude, tearing up everything that obstructed their progress, desolating the plains and valleys, and destroying the whole town of Martigny. Many of the inhabitants lost their lives, and the rest were reduced to the most abject poverty.

After this sad event the ice and snow continued to fall into the valley at this spot from the glacier above, as before; and at length they accumulated to such a mass as to resist the heat of the sun in summer, so that a further accumulation took place. The glacier itself, too, continued to travel downwards, so that by the year 1818 the bed of the stream was blocked up by a conical mass of ice and snow more than a hundred feet in height. For some time the river contrived to find its way under or through the crevices in this barrier; but at length, owing to fresh portions of mingled ice-rocks and snow being cast down from the sides of the glacier, the various channels or tunnels which the river had excavated became choked up. As soon as this took place, the waters, having no outlet, began to form a lake, which gradually increased to half a league in length, about seven hundred feet broad at the top, one hundred at the bottom, average depth two hundred feet, and was estimated to contain eight hundred millions cubic feet of water.

Such was the state of things in April, 1818, and it is supposed that no harm would have resulted had the barrier been formed of rocky materials; for in that case, as soon as the water in the lake had risen to the top of the barrier it would have flowed over the edge, and merely formed a cascade. But as the barrier was formed of ice and snow principally, its permanence could not be so justly looked for; and the experienced Swiss, fully awakened to their danger, saw that, unless they adopted some very prompt and energetic measures, the weight of the accumulated waters would soon become too great for the weight of the dam of ice, and the whole reservoir would at once be dashed down the ravine, to the destruction of all the villages, fields, bridges, and mills, which, although built on sufficiently elevated spots to escape common overflows, would be swept away by such a one as this.

Under these circumstances, a bold and enterprising engineer of Martigny, M. Venetz, set about devising a plan which, though it could not prevent the evil, might possibly lessen it. He conceived that the water might be prevented from rising above a certain level in the lake, if a gallery or tunnel could be cut through the barrier of ice at such a height above the level of the lake at that time as would enable the work to be finished before the water should rise to that point. This required not only a very nice calculation, but a great degree of vigour and activity in the execution. The drift or gallery which M. Venetz proposed to bore through the barrier was made to slope downwards, in such a way that when the water rose to its upper end it should flow so rapidly through that it might act like a saw, and, by cutting down the ice, permit the water from the lake gradually to descend, till it was nearly emptied, and the mass of water be prevented from becoming an overmatch for the retaining wall of ice and snow.

These bold and ingenious operations were begun on the 10th of May and finished on the 13th of June. The gallery was sixty-eight feet long (being the thickness of the barrier at the spot chosen for the perforation), and during its formation the workmen were exposed to the constant risk of being crushed to pieces by the falling blocks of ice, or of being buried under the glacier itself. In the mean time the surface of the lake had risen sixty-two feet, but as it had not yet reached the upper orifice of the gallery, M. Venetz, having secured a thorough opening through the barrier, set to work to cut down the floor of the tunnel till it met the rising waters, which then began to flow rapidly through the passage. The floor of the gallery went on wearing away, as had been anticipated, so fast that by the next day the lake had diminished in depth one foot; and this evidence of the power of the engineer began to inspire hope in the terrified inhabitants. On the following day the lake had subsided ten feet; and on the 16th, or only three days after the water had begun to flow through the tunnel, it had sunk forty-five feet. But there was soon to be an end to the hopeful anticipation.

As soon as the water flowed from the lower end of the gallery the velocity of the cascade melted the ice, and thus wore away the gallery at its mouth. The water which had penetrated the crevices of the glacier caused enormous fragments of ice to fall from the lower side of it, so that owing to these causes the body of the glacier, which formed the retaining wall of the lake, was so much diminished in thickness, that the floor of the gallery was reduced from six hundred feet to eight feet in length. As soon as the cascade had cut through the cone of ice, it attacked the shore of the neighbouring mountain, and undermined the glacier by washing away the loose materials forming the bed of the stream on which this mass of ice had been piled up; and having carried it off by degrees, the water next forced an opening between the glacier and the foot of the mountain. As soon as this happened the water rushed out, the ice gave way with a tremendous crash, the lake emptied itself in half an hour, and the sea of water which it contained was precipitated into the valley with a rapidity and violence truly terrible. The fury of this raging flood was first stayed by a narrow gorge, over which a bridge was thrown at a height of ninety feet. But it soon carried away the bridge, and spread itself over a wider part of the valley, then through another gorge, again through a wider part of the valley, and so on, till it reached the Rhône at Martigny, carrying away with it forests, rocks, houses, barns, and cultivated lands.

Captain Basil Hall arrived at Martigny seven weeks after the catastrophe, and thus speaks of what met his view, even in that place, where the fury of the flood had nearly spent itself:—"Many of the houses had been swept away, and all the remaining habitations gave token of having been invaded by the flood, which

even at the lower extremity of the town, where the valley is widest, had risen to the height of ten feet. All the hedges, garden walls, and other boundary-lines and landmarks of every description, were of course obliterated under one uniform mass of detritus, which had levelled all distinctions in a truly sweeping and democratic confusion. In every house, without exception, there lay a stratum of alluvial matter several feet in thickness, so deposited that passages had to be cut through it along the streets, as we see roads cut in the snow after a storm. On that side of every building which faced up the valley, and consequently against which the stream was directed, there had been collected a pile of large stones under all, then a layer of trees, with their tattered branches lying one way, and their roots the other; next came a net-work of timber-beams of houses, broken doors, fragments of mill-wheels, shafts of carts, handles of ploughs, and all the wreck and ruin of the numerous villages which the debacle had first torn to pieces and then swept down the valley in one undistinguishable mass. The lower part of the bark had been completely stripped off all the trees still standing, each one being charged on the side next the torrent with a singular accumulation of rubbish, consisting chiefly of uprooted trees and those wooden portions of the buildings which were bolted together. I ought to mention also, that from every house, and behind every tree, circumstanced as I have described, there extended down the valley a long tail or train of diluvial rubbish, deposited in the swell, or, as a sailor would say, in the eddy, under the lee of these obstacles. All over the plain large boulders, or erratic blocks, lay thickly strewed."

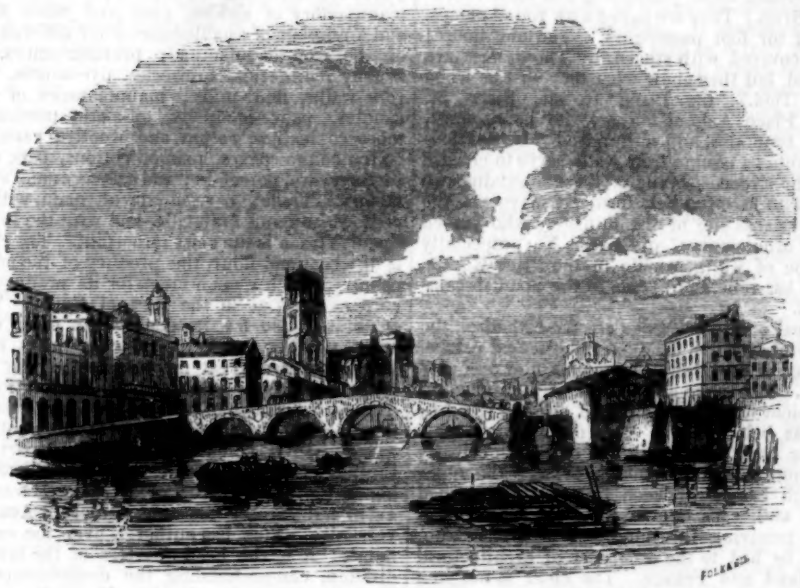
Pavement of Paris.—Paris exhibits a mixture of stone, bitumen, and wood pavements. The principal streets of the city were first paved so early as 1184, by order of the king; but in many of the quarters the streets were unpaved so late as 1640. Beckmann gives a curious account of the police regulations concerning the cleansing of the streets, from which we may infer that road-ways were in a very miry state; indeed, modern Paris has not had high credit for the condition of its streets. Sir Henry Parnell, in his 'Treatise on Roads,' remarked that the best kind of Paris paving was thus made:—A layer of broken stones was first laid down; then the old paving-stones were laid as a sub-pavement; and, lastly, a new layer of dressed stones for the surface-pavement; forming altogether a very durable road-way. Bitumen pavements have been laid down to a greater extent in Paris than in London. The great Place de la Concorde, many of the promenades on the Boulevards, the foot-paths of the Pont Royal and the Pont Carousel, one side of the Pont Neuf footway, and other public places in Paris, have been paved with one or other of the different asphaltic bitumens.—*Companion to Almanac.*

Trees of Port Phillip.—In point of beauty, it must be confessed that the green-wood tree of the Australian forests, though often rising to a noble height, and as picturesque in its outlines and attitudes as any that bears a leaf, nevertheless stands far below any individual of our English woods. Not that its limbs are less giant-like or less boldly thrown into the air, but there is wanting the rich burden of foliage which a colder climate heaps with such profusion on the bending branches; and we miss the shade that spreads around each stem, and diffuses the grateful coolness we were wont to enjoy. In comparison with the plumage of the oak or elm, theirs is a scanty sprinkling of drooping attenuated leaves; a crop so thin-sown as to seem as if dwarfed in its early growth by some blight, and to have remained ever since in a state of premature decay. Moreover, to increase their disadvantages, the hues with which they greet the eye exclude every tint of a bright description, a dull green being the prevailing shade of shrub as well as tree. This it is that tinges every landscape with a degree of monotony and sadness that could not fail to convey a gloomy impression, did we not see the prospect invariably lighted up by a brilliant sunshine, and diversified by natural features of the highest beauty.—*A Summer at Port Phillip, by the Hon. R. D. Murray.*

Population of the United States to the Square Mile.—In 1790, Rhode Island, the most densely peopled state, had 51·5 inhabitants to a square mile. In 1800, Connecticut had the largest number (52·7) of inhabitants to a square mile; in 1810, Rhode Island again, the proportion being 57·4 to a square mile. Since 1820, Massachusetts has been the most populous state, in reference to its size, the number of inhabitants to a square mile having been 69 in 1820, 81 in 1830, and 98 in 1840. Westmoreland has only 74 inhabitants to a square mile, but then this is to be accounted for by the physical peculiarities of the country. No fertile English county contains so few as 100 persons to a square mile; Lincolnshire, which is the most thinly populated, has 138 inhabitants to a square mile. In 1790, the number of inhabitants to a square mile in the whole of the states was 3·9; 5·3 in 1800, 7·2 in 1810, 9·6 in 1820, 12·8 in 1830, and 13·5 in 1840, while at the same time, by the admission of new states into the Union, the territory had been constantly extending. With only 200 persons to each square mile (in England we have above 300 to a square mile), the population of this immense territory would be above 251 millions!—*Companion to the Almanac for* 1844.

The Type of the Spaniards.—In the character of the Iberians some traits may be recognised, which even to this day mark the Spaniard. The grave dress, the temperance and sobriety, the unyielding spirit, the extreme indolence, the perseverance in guerilla warfare, and the remarkable absence of the highest military qualities, ascribed by the Greek and Roman writers to the ancient Iberians, are all more or less characteristic of the Spaniards of modern times. The courtesy and gallantry of the Spaniard to women has also come down to him from his Iberian ancestors: in the eyes of the Greeks, it was an argument of an imperfect civilization, that among the Iberians the bridegroom gave, instead of receiving, a dowry; that daughters sometimes inherited to the exclusion of sons, and, thus becoming the heads of the family, gave portions to their brothers, that they might be provided with suitable wives. In another point, the great difference between the people of the south of Europe and those of the Teutonic stock was remarked also in Iberia: the Iberians were ignorant, but not simple-hearted; on the contrary, they were cunning and mischievous, with habits of robbery almost indomitable, fond of brigandage, though incapable of the great combinations of war. These, in some degree, are qualities common to almost all barbarians; but they offer a strong contrast to the character of the Germans, whose words spoke what was in their hearts, and of whose most powerful tribe it is recorded, that their ascendency was maintained by no other arms than those of justice.—*Arnold's Rome*, vol. iii.

The Orange-Groves of Mexico.—The orange-trees were covered with their golden fruit and fragrant blossom: the forest-trees, bending over, formed a natural arch, which the sun could not pierce. We laid ourselves down on the soft grass, contrasting this day with the preceding. The air was soft and balmy, and actually heavy with the fragrance of the orange-blossom and starry jasmine. All around the orchard ran streams of the most delicious clear waters, trickling with sweet music, and now and then a little cardinal, like a bright red ruby, would perch upon the trees. We pulled bouquets of orange-blossom, jasmine, lilies, dark red roses, and lemon leaves, and wished we could have transported them to you, to those lands where winter is now wrapping the world in his white winding-sheet. The gardener or coffee-planter—such a gardener!—Don Juan by name, with an immense black beard, Mexican hat, and military sash of crimson silk, came to offer us some orangeade; and, having sent to the house for sugar and tumblers, pulled the oranges from the trees, and drew the water from a clear tank overshaded by blossoming branches, and cold as though it had been iced. There certainly is no tree more beautiful than the orange, with its golden fruit, shining green leaves, and lovely white blossom with so delicious a fragrance. We felt this morning as if Altacamulco was an earthly paradise. . . . But when the moon rose serenely and without a cloud, and a soft breeze, fragrant with orange-blossom, blew gently over the trees, I felt as if we could have rode on for ever, without fatigue, and in a state of the most perfect enjoyment. It was hard to say whether the first soft breath of morning, or the languishing and yet more fragrant airs of evening, are more enchanting.—*Madame Calderon de la Barca.*



[View of Toulouse.]

TOULOUSE.

Toulouse, a city in France, was formerly the capital of the province of Languedoc, and is now the chief town of the department of Haute Garonne, 363 miles in a direct line south by west of Paris, or 438 miles by the road through Orléans, Châteauroux, Limoges, Cahors, and Montauban; in 43° 35′ N. lat. and 1° 26′ E. long.

The notices of this town in ancient writers are more numerous than of most towns in Gaul, and relate to an earlier period: the name was written by the Latin authors and in inscriptions Tolosa and Tholosa. By a similar variation to this last the name has been written in later times Toulouse and Thoulouse, but the *h* is now generally omitted. In the time of the Gauls this city, which belonged to the Volcæ Tectosages, a Celtic nation, contained an enormous treasure in gold and silver, which was seized by the Romans under Cæpio, B.C. 106. As the treasure had been deposited in consecrated places, the seizure of it was regarded as sacrilege; and the misfortunes which afterwards overtook the perpetrators occasioned "the gold of Toulouse" ("aurum Tholosanum") to become a proverbial expression for treasure which brought ruin upon its owners. (Aulus Gellius, *Noctes Atticae*, III. ix.) Toulouse was afterwards subject to the Romans, the Visigoths, and the Franks, and in the middle ages had counts of its own, who were potentates of great importance in the south of France. The last historical event of importance connected with it was the battle fought, 10th April, 1814, between the allied army under the Duke of Wellington, and the French under Marshal Soult. The English were victorious, and Soult was obliged to evacuate the town.

Toulouse is situated on the right or east bank of the Garonne, which, flowing from the south, bends westward, forming a crescent, on the concave side of which the town stands. As the Canal du Midi, or Canal de Languedoc, which unites the Garonne with the Mediterranean, opens into the river a short distance below the town, and has its course for some distance parallel to the river, the site of the town and its suburbs is a peninsula, enclosed between the Garonne, close to the town, on the west, and the canal at a little distance on the north and east. On the south side, but at some distance, are the heights of Pech-David; and on the east, beyond the canal, and between it and the little river Lers (which flows parallel to the canal, and falls into the Garonne below it), are the heights of Mont Rave, on which the fiercest part of the battle of Toulouse, in 1814, took place.

The town and the suburb of St. Cyprien, which is on the opposite bank of the river, are enclosed by walls, erected in the middle ages, and are united by a bridge of seven arches, the Pont Neuf, about eight hundred and sixty feet long, erected under Louis XIV., from the designs of Souffron, which crosses the river in the middle of the bend. The river is lined with handsome quays. The walls (which have nine gates) appear to have been, in 1814, tolerably entire, and "so thick as to admit sixteen and twenty-four pounder guns;" but later authorities describe them as gradually disappearing in the progress of improvement. Besides St. Cyprien, there are several faubourgs, or suburbs: Bazacle, on the north-west, close to the river; Arnaud-Bernard, on the north; Matabiau, on the north-east; St. Etienne and Guillémérie, on the east; and St. Michel, on the south: the faubourgs Arnaud-Bernard, Matabiau, and St. Etienne extend to the Canal du Midi; and Guillémérie lies beyond the canal, adjacent to St. Etienne. On the south-east side of the town, between St. Etienne and St. Michel, is the Esplanade, a circular space surrounded by trees, planted so as to form four concentric circles, and having six avenues radiating from it, each with four rows of trees, forming three alleys. The streets of the town itself were, till of late years, narrow and crooked: the squares irregular in form, the houses built of brick, and few of the edifices of a handsome appearance; but improvement has latterly been very rapid. The town is still, however, as it were in a state of transition: "its streets, commonly narrow and crooked, become still more irregular, as, in taking care to give them a better direction, old houses are replaced by others arranged upon a new line; so that, with some exceptions, the streets

present only houses, some protruding and some receding." (Malte-Brun.) They are paved with round stones, very fatiguing for foot passengers. The old houses are generally covered with stucco. "The squares are still unfinished, but they show what they will be when completed" (Ibid.): the Place Royale, Place St. George, and Place Angoulême are the handsomest. Ten or more fountains, and a hundred "bornes fontaines," or fountains issuing from walls, serve to cleanse and refresh the streets. Many of these fountains owe their erection to M. Montbel, formerly mayor of the city, and afterwards one of the ministers who signed the unlucky 'ordonnances' of Charles X.: especially he erected one of white marble in the Place Royale, adorned with bas-reliefs of events in the Spanish campaign of 1823.

The principal public buildings are the cathedral, the capitol or Hôtel de Ville, the ex-archiepiscopal palace, and the church of the Grands Augustins, now occupied as a museum. The nave and portal of the cathedral are more ancient than the choir, and are described by Malte-Brun as belonging to "an old heavy Gothic church:" the choir, erected in the sixteenth century as part of a new edifice designed to replace the older one, but which has never been finished, is described by the same author as one of the most beautiful in France. In receiving the judgment of Malte-Brun, regard must be had to the difference of architectural taste in England and France. The choir is not in a line with the nave, so that the whole structure has a very irregular figure, somewhat like this. In the

tower of the cathedral is "the bell of Cardaillac," weighing 50,000 lbs. French. The town-hall or capitol is almost entirely a modern building, erected on the site of a more ancient one. It has a front of about 380 feet long by 128 high, and is of most imposing appearance. The court is shown in which the Duke of Montmorency is said to have been beheaded, A.D. 1632, and which must therefore be a remain of the older building. A gallery termed "Galerie des Illustres" is set apart for busts of those persons, natives of the city or connected with it, whom the town has thought worthy of the honour of a place. The ex-palace of the archbishop, now occupied by the prefect of the department, is the handsomest modern building after the capitol. The museum in the cloister and church of the Grands Augustins contains a number of antiquities which have been collected in the department. Besides these edifices may be noticed the theatre; the new court-houses for the Cour Royale and the tribunal de première instance; the veterinary school; the church of La Dorade, built on the site of an ancient heathen temple, and that of St. Saturnin, the interior of which is very impressive; the vast hospitals of the Hôtel Dieu and St. Joseph-de-la-Grave; the mill of Bazacle; the abattoirs; and the bridge and bas-relief at the junction of the Canal du Midi and the Canal de Brienne. This latter canal, which is very short, connects the Garonne at the mill of Bazacle, adjacent to the town wall, with the Canal du Midi. In the Ile de Tonnis, a small island in the Garonne opposite the town, and indeed forming part of it (for the island is covered with buildings), are the ruins of the Castle of Narbonnais, the former residents of the counts of Toulouse. Toulouse has scarcely any remains of Roman buildings. There are a large public garden; a botanic garden, rich especially in plants from the Pyrenees and in exotics, where courses of instruction in botany are given; and a public walk, 'Cours Dillon,' in the Faubourg St. Cyprien, on the bank of the Garonne.

The population of the commune of Toulouse in 1826 was 55,319; in 1831, 59,630; and in 1836, 77,372. There are bell-foundries and copper-mills; a very large manufactory of sickles, files, and other hardwares; and a number of establishments for different branches of the iron-manufacture; printing-offices, oil-mills, brandy distilleries, breweries, dye-houses, tan-yards, rope-walks, flour-mills; manufactories of wax, wax-candles, paper-hangings, oil-cloth, musical strings, morocco leather, cotton and woollen yarn, blankets, cotton counterpanes, printed cottons, hats, straw-hats, earthenware, porcelain; and a government stuff-manufactory. Trade is carried on with Spain, with the ports of Bordeaux and Marseille, and with the interior: the Spanish trade is the most important. The chief export is of wheat and flour, the produce of the surrounding country, which was eminent for its productiveness in corn as early as in the time of Cæsar. Toulouse is celebrated also for its ducks'-liver pies, of which a great number are sent to other parts of France. There are two great markets in the year for flowers and salt pork; and eight fairs, including four of eight days each and two of three days: one of the eight-day fairs is an important fair for wool and woollen cloth.

Toulouse is the chief town of the department; it is the seat of a Cour Royale, whose jurisdiction comprehends the departments of Arriège, Haute Garonne, Tarn, and Tarn et Garonne, and of an Académie Universitaire, which has authority over the same departments: it is the head-quarters of the tenth military division, comprehending the departments of Aude, Pyrenées Orientales, Arriège, Haute Garonne, Hautes Pyrenées, Gers, and Tarn et Garonne. It has an assize court, a chamber of commerce, a tribunal of commerce, a tribunal de première instance, or subordinate court of justice, a mint, and several fiscal government offices. There are a royal cannon foundry, an arsenal, and an artillery school.

The archbishopric of Toulouse originated as a bishopric in the third century: St. Saturninus, the first bishop, is said to have suffered martyrdom, A.D. 250: it did not attain to its metropolitan rank till the fourteenth century. It is now united with the archbishopric of Narbonne, to which its bishops were anciently suffragans: the style of the prelate is Archbishop of Toulouse and Narbonne. The diocese includes the department of Haute Garonne, and the archbishop's suffragans are the bishops of Montauban, Pamiers, and Carcassone.

Toulouse is distinguished by the attention of the townsmen to literature. It possesses a number of establishments for public instruction: its schools include two thousand students, and there are several learned societies which distribute prizes. The most eminent of these is the Académie des Jeux Floraux, which distributes prizes for the best poems: the prizes, which are golden flowers, are open to the competition of all France. This society originated in the middle ages, probably in or before the thirteenth century, certainly not later than the fourteenth, and appears to have been an association of trouvères, or troubadours. The poetical contests held by the society, and known as the Jeux Floraux, are thought to have been revived from the neglect into which they had fallen, by Clémence Isaure, a young lady of family, who devoted her property to form a perpetual endowment for these "games," or annual poetical contests, which are still kept up. There is an antient statue of Clémence in the Galerie des Illustres, but the epoch at which she lived is not ascertained. There are an academy of inscriptions, sciences, and belles-lettres; an academy of painting, sculpture, and architecture; a royal college or high school, a seminary for the priesthood, a secondary school of medicine and surgery, a school of arts and trades, a drawing-school; a royal riding, music, and singing school; courses of instruction in

geometry and practical mechanics; on experimental philosophy, chemistry, and midwifery, at the Hôtel Dieu; and societies of medicine, of the fine arts, and of agriculture. There are two public libraries, one of 30,000, the other of 24,000 volumes: one of these (attached to the college) has the prayer-book (les Heures) of Charlemagne, written in golden letters on vellum, given by that prince to the abbey of St. Sernin, A.D. 778. There are (or were lately) eleven printing-offices, twenty-three booksellers' shops: two political journals, and nine devoted to literature and the sciences, are published. There are a botanic garden, a departmental nursery, and an observatory, where courses of instruction on astronomy are given.

There are a society of maternal charity, a Protestant Bible Society, and a society for granting loans on security without interest; two hospitals, an orphan asylum, and six maisons de secours, or houses for the relief of the destitute.

The arrondissement of Toulouse has an area of 612 square miles, and comprehends 138 communes: the population, in 1831, was 139,927; in 1836, 159,064. The arrondissement is divided into twelve cantons or districts, each under a justice of the peace.

USES OF THE POPLAR-TREE.

There is perhaps no tree better distinguished from others, even by those who possess but little knowledge on the subject, than the poplar. Its great height as compared with its diameter singles it out from most other trees, and has a very curious effect in the grouping of a landscape.

This tree is a native of Europe, of North America, and of some parts of Asia and North Africa. It is of rapid growth, and is everywhere remarkable for a degree of tremulous motion in the leaves when agitated by the least breath of wind; this arises from the great length of the petioles, in proportion to the size and weight of the leaves to which they are attached. There are different varieties of the poplar, two or three of which we may notice in succession, in reference to their useful qualities.

The *White Poplar* forms a tree from eighty to one hundred feet in height, generally with a clear trunk to a considerable height, and a spreading head thinly clothed with foliage. Many facts have been recorded illustrative of its rapid growth. Evelyn mentions one of these trees at Sion, "which, being lopped in February, 1651, did, by the end of October, 1652, produce branches as big as a man's wrist, and seventeen feet in height." Branches of the white poplar, nine feet long, planted on the banks of a stream some yards from the current, have been known in twelve years to produce trunks ten inches in diameter. It has been stated that one of these trees, planted in a field, and surrounded by a fence at twenty-five feet distance from it on every side, formed by its suckers in twenty years a circular clump of wood fifty feet in diameter; and consequently that thirty or forty trees would cover an acre with a thick wood in the same space of time.

The white poplar, or, as it is sometimes called, the *Abele*, was known to the Romans. As a road-side tree it has been much planted in modern times in Holland, Flanders, France, and Germany. In the forests of France it is in some places so abundant as to form the prevailing tree over extensive tracts of country; and it furnishes fuel for the adjoining towns, more especially for bakers' ovens, those of Paris being almost entirely heated by the wood of this tree, which is then called *bois blanc* (white wood).

As a timber-tree the white poplar does not hold a prominent rank. The wood is very white, and is used in France and Germany for a variety of minor purposes, particularly where lightness of weight or of colour is desirable, or where an artificial colour is to be given to it by staining. It makes excellent packing cases, because nails may be driven into it without its splitting. It is used by the turner and the cabinet-maker, and a great many toys and small articles are made of it. The boards and rollers around which pieces of silk are wrapped in merchants' warehouses and in shops are made of this wood, which is peculiarly suitable for this purpose from its lightness, lessening the expense of carriage. The principal use of the white poplar wood in Britain is for flooring-boards; but for this purpose it requires to be seasoned two or three years before using. When felled at the point of maturity (at the age of about forty or fifty years, if growing on the banks of a river; or sixty or seventy years, if growing in a dry situation) the wood is good for most kinds of building purposes, especially on farms, where it is very suitable for the large folding doors for barns, as it is light and does not warp. It is also used as a substitute for the wood of the lime-tree by musical-instrument makers. In Scotland it is sometimes used in mill-work, and by the cabinet-maker and turner; and it is frequently used by the cooper for making wooden dishes and casks. In Sweden the leaves are eaten by cattle, and are considered wholesome.

The *Black Poplar* is a very large tree, with an ample head, composed of numerous branches and terminal shoots. The bark is ash-coloured, and becomes rough and deeply furrowed by age. This tree is found nearly in the same countries as the white poplar, but it is rather less common in the colder parts of Europe. In a natural state the leaves and young shoots are eaten by cattle.

The timber of the black poplar is applied to most of the purposes connected with the use of white poplar. Its most general use on the Continent is for packing-cases, more especially for the transport of bottled wines. The wood is yellow, soft, and, being more fibrous than that of any other species of poplar, it splits very readily. It is a good deal employed by joiners and cabinet-makers, as being soft and easy to work. The wood never splinters, and was said by Evelyn to be "incomparable for all sorts of white wooden vessels, as trays, bowls, and other turner's ware." It is used for making clogs, and for the soles as well as heels of wooden shoes. It is employed by the cartwright; and it was ranked by Vitruvius among building-timber. When planted thickly, and cut down for rafters, poles, and rails, few trees make a quicker return. In Russia the bark is employed in the preparation of morocco leather; and when it is pulverized it is eaten by sheep; in England it is used, like oak-bark, for tanning leather. The bark of the old trunk, being very thick, light, and corky, is employed by fishermen to support their nets, and is sometimes used as cork for bottles.

The buds, macerated in boiling water, and afterwards bruised in a mortar and pressed, yield a fat substance which burns like wax and exhales a fine odour. The balsamic sap with which the buds are covered forms the basis of an ointment which was much prized in former times. The young shoots, especially when the plants are kept low, may be used as a substitute for the willow in basket-making. When the tree is pollarded and lopped every three or four years, it produces a great quantity of fuel, which can be used green. The shoots with the leaves on are formed into brooms. The cottony substance or flock which surrounds the seeds has been used in Germany and France as wadding; and it has also been manufactured into cloth, hats, and paper; but the expense of collecting it, and the want of length and elasticity in the fibre, occasioned the manufacture to be given

up. In Kamtschatka and in Norway the inhabitants are sometimes under the necessity of drying the inner bark and grinding it, in order to mix it with their oatmeal. The flowers of this tree are said to be much sought after by bees.

The *Lombardy poplar* is the tall slender variety which forms the most distinctive instance of the species. It grows extensively in Lombardy, whence it derived its name; and has become a favourite throughout Europe for the fine effect which it produces in the grouping of an ornamental plantation. Mr. Loudon (whose indefatigable and valuable labours have been recently terminated by death) gives numerous cuts to illustrate the effect of the Lombardy poplar upon landscape scenery.

The wood of this tree is inferior to that of the *black* poplar, but is still serviceable for many purposes. When Arthur Young, the agriculturist, travelled in Italy, he found that the Lombardy poplar grew to the height of forty feet in eight years, and that in twelve years it was fit to be cut down for building purposes. Rafters, small beams, boards, &c., brushed over with coal-tar and brick-dust laid on hot, have stood sixteen years without the least decay. In twenty years the tree produces a trunk two feet in diameter. All the vessels in which grapes were carried home from the vineyards were formerly made of Lombardy poplar planks about two inches thick; but they are now formed of the wood of the black poplar. These kind of vessels last thirty or forty years; and in consequence of the lightness of the wood, they are easily manageable, however large they may be: one of them is generally placed on a four-wheeled cart, and holds fifteen cwt. of grapes.

Mr. Murray mentions a curious phenomenon connected with the Lombardy poplar, which is probably attributable to its great height:—"I had frequently observed, in avenues of trees, that the entire space engrossed by their shady foliage was completely saturated with moisture; and that during the prevalence of a fog, when the ground beneath was completely parched, the wet which fell from their branches more resembled a gentle shower than anything else; and in investigating the phenomenon, which I am disposed to consider entirely electrical, I think the elm exhibits this feature more remarkably than any other tree of the forest. I never, however, was more astonished than I was in the month of September, 1828, on witnessing a very striking example of this description. I had taken an early walk on the road leading from Stafford to Lichfield; a dense fog prevailed, but the road was dry and dusty, while it was quite otherwise with a line of a few Lombardy poplars; for from them it rained so plentifully, and so fast, that any one of them might have been used as an admirable shower-bath; and the constant stream of water supplied by the aggregate would (properly directed) have sufficed to turn an ordinary mill." This was probably occasioned by a cloud of vapour, driven towards the trees, being condensed by contact with their foliage.

There are several varieties of the poplar in America. One of these, called by the somewhat circuitous name of the *Various-shaped-leaved Poplar-tree*, is a native of North America, producing a soft light yellowish wood, applied to some few purposes in the arts. Another, called the *Balsam poplar*, yields a balsam, from which its name is derived. This balsam is procured from the buds, and used formerly to be sent from Canada and other parts of North America in shells, under the name of "baume focot;" having been collected from the trees in spring, when, in consequence of the heat, it is dissolved, and collects into drops on the points of the buds. It is of a smooth and even texture, and is soluble in spirits of wine. In Siberia a medicated wine is prepared from the buds, which is diuretic, and considered serviceable in the scurvy. Pallas states that the grouse and other birds of that family that feed on the buds of this poplar during winter have their flesh imbued with a grateful balsamic flavour.

One of the most remarkable varieties is the *Trembling Poplar*, more commonly known as the *Aspen*. The trembling to which its leaves are subjected when the slightest breath of wind blows is owing to the manner in which they are connected to the stalks. The allusions to this tree in our poets and novelists are so numerous, that many will occur to the minds of most readers; but we shall here only mention a few of the uses of the tree.

In the natural state the bark forms the principal food of beavers, in those countries where the animal abounds; and deer, goats, and other quadrupeds are fonder of the spray and buds of this than of any other tree. The young shoots and leaves, produced in the form of suckers from the roots, are greedily eaten by cattle and sheep. The wood is white and tender, and is employed by turners; by coopers, for herring-casks, milk-pails, &c.; by sculptors and engravers; by joiners and cabinet-makers; and the makers of various minor articles, such as clogs, butchers' trays, pack-saddles, &c. In France, sabots are made of the wood, and also the bars and pins which serve to retain the bottoms of casks; under-pinnings for flooring, laths, rounds of ladders, and wooden vessels of different kinds. The leaves are employed in France, Germany, and Sweden as food for cattle, sheep, and goats, either in a green or dried state; and they are cut every two years for that purpose during summer. The powdered bark, given in doses of half a pound each, is useful for some of the diseases of horses. In Russia the bark is used in domestic medicine for scorbutic cases. In the Highlands of Scotland the bark of the young trees is sometimes made into torches. As fuel, the wood is of inferior quality; but on account of its giving out its heat with great rapidity, it is deemed fitted for heating ovens and close stoves.

Memory of Bees.—I was living in a town where I knew some few bees were kept, and I chanced to have some coarse comb, from which the honey had drained; so, instead of being greedy, and squeezing out all I could get, I determined to give a feed all round to such bees as chose to accept my invitation to dinner. This invitation I gave by opening the window, and setting the honey on the sill. In about half an hour some foragers found it out; they helped themselves, and carried back the good news to the sisters in the hive. In the course of the morning my room literally swarmed with bees, and I need not tell you, as they are grateful creatures, that they did not meddle with me, but as I sat at my books, repaid me for my treat with their sweet music. In the afternoon they were satisfied, at least for the day, and dropped off, one by one, without committing any excess. There is nothing strange in all this, but now comes the wonderful part of the story: I, myself, got up next morning, some time before bees are usually stirring, and, as I went to my window (it was in September) to see the first rays of the sun in the eastern sky, I was much surprised, and not a little delighted, to see a number of bees, who had remembered and been grateful for their dinner the day before, waiting for me to let them in to a similar breakfast. As some of the honey was left, you cannot doubt but that I complied with their wish, which was clear enough to me, though they had no tongue to express it. I opened the window; the room was soon filled; they cleared the combs of honey, and then went orderly away. They haunted my windows for several mornings after, though I had no more honey to give them. This is, I think, a pretty strong instance of memory in bees.—*Cotton's Bee-Book.*